

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No.12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROHIT AGARWAL

Appeal No. 1997-0401
Application 08/305,262

ON BRIEF

Before THOMAS, HAIRSTON and FRAHM, Administrative Patent Judges.

FRAHM, Administrative Patent Judge.

DECISION ON APPEAL

Appellant has appealed to the Board from the examiners' final rejection of claims 1 to 20, which constitute all of the pending claims in the application before us on appeal.

BACKGROUND

The subject matter on appeal is directed to a method for dithering during a color conversion process in a digital video

processing system such that video artifacts (i.e., graininess) can be reduced (see specification, pages 1 to 2; Brief, page 3). Appellant recognized that conventional dithering processes which are known to reduce contouring in images suffer from the use of a fixed dithering matrix, resulting in undesirable artifacts, or graininess, being reproduced in an image (see specification, page 2). As indicated by appellant (specification, pages 2 to 3; Brief, page 3), when the dithering matrix added to groups of pixels in an image is changed frame by frame in a sequence of frames of pixels, it is possible to reproduce a more natural appearing image and to prevent graininess normally associated with dithering.

Appellant's dithering method recited in claims 1 to 20 on appeal provides that different dithering matrices be picked over time such that the time-averaged dither intensity at any given pixel location is zero (specification, page 3). Thus, by using different dither matrices frame by frame sequentially in time in patterns that average out to a zero dither intensity for each pixel location, both graininess and contouring in an image can be eliminated (see specification, page 6). As further discussed, infra, we find that the

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applied references to Oz, and particularly Keith, fail to teach or suggest at least this important feature of adding different dither value matrices to pixels "wherein the time-averaged value of said dither values at a given pixel location is zero" (independent claim 1 on appeal).

Representative method claim 1 is reproduced below:

1. In a digital video processing system, a method for dithering quantized color values having a given step size during a color conversion process, comprising the steps of:

(A) adding a set of dither values to first color values throughout a first frame of digital video values;

(B) adding a different set of dither values to second color values throughout a second frame of digital video values, said second frame being subsequent to said first frame in time sequence; and,

(C) repeating steps (A) and (B) for subsequent frames in time order;

wherein the time-averaged value of said dither values at a given pixel location is zero.

The following references are relied on by the examiners:

Keith	5,381,180	Jan. 10,
1995		
		(filed Aug. 16,
1993)		
Oz	5,450,098	Sep. 12,

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1995
1992)

(filed Sep. 19,

Claims 1 to 20 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Oz in view of Keith.

Rather than repeat the positions of appellant and the examiner, reference is made to the Brief and the Answer for the respective details thereof.

OPINION

For the reasons generally set forth by appellant in the Brief, and for the reasons which follow, we will reverse the rejection of claims 1 to 20 under 35 U.S.C. § 103. In reaching our conclusion on the issues raised in this appeal, we have carefully considered appellant's specification and claims, the applied patents, and the respective viewpoints of appellant and the examiner. As a consequence of our review, we are in general agreement with appellant that the applied references would neither have taught nor suggested the appellant's claims on appeal.

The examiner and appellants are in agreement that the primary reference to Oz does not teach dithering. The

examiner relies upon the secondary reference to Keith to teach or suggest a dithering process used to prevent contouring in an image. We agree with appellant that the primary issue before us on appeal "is whether Keith discloses or suggests a dithering method or apparatus which applies a different dithering matrix (dithering values) to identically located groups of pixel values over sequential frames of digital video" (Brief, page 5). We are in agreement with appellant (Brief, pages 5 to 7) that Keith fails to teach or suggest the recited feature of representative claim 1 of applying different dithering values to pixels in sequential frames such that the time-averaged value of the dither values at a given pixel location is zero.

Appellant argues (Brief, page 5) that Keith fails to teach or suggest applying different dithering matrices to a sequence of digital video frames over time, as is done in claim 1 on appeal. We agree, and we find that this zero time-averaging dithering feature is neither taught nor would have been suggested by Keith. Although we agree with the examiner that Keith teaches adding random noise in the form of a dither matrix to each of three-component data, we find that Keith

fails to fairly teach or suggest that the random noise used to produce dithered images changes over time. Thus, we are also in agreement with appellant (Brief, page 6) that Keith fails to teach or suggest that different noise values be applied to pixels in subsequent frames as required by representative claim 1 on appeal.

We agree with appellant that "Keith expressly discloses generating a single set of dithering matrices (one for each of the U and V components)" (Brief, page 6), as opposed to using differing dithering matrices over time as in the claims on appeal. In Keith, each component is processed using the same dithering matrix over and over. There is no disclosure of using different matrices over time for a group of pixels in an image. Our review of Keith reveals that "[t]his processing is performed for each (4X4) subimage of each video image in the sequence of video images" (Keith, column 4, lines 16 to 19)(emphasis added). Therefore, we cannot agree with the examiner (Answer, pages 3 to 4) that one of ordinary skill in the art looking at Keith (especially column 2, lines 49 to 55 as noted by the examiner) would have been motivated to use differing dithering matrices over time in order to time-

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average pixel values to zero.

Accordingly, we cannot sustain the rejection of claims 1 to 20 under 35 U.S.C. § 103.

Although we find that the examiner has made a prima facie case of obviousness as to the appealed claims, we conclude that appellant has rebutted this prima facie case by successfully showing that the specific zero time-averaging dithering method of the appealed claims is neither taught nor would have been fairly suggested by the secondary reference to Keith. In view of the foregoing, the decision of the examiner rejecting claims 1 to 20 under 35 U.S.C. § 103 is reversed.

CONCLUSION

The decision of the examiner rejecting claims 1 to 20 under 35 U.S.C. § 103 over Oz in view of Keith is reversed.

REVERSED

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